

# Planetary Imaging Concept Testbed Using a Recoverable Experiment - Coronagraph (PICTURE-C)

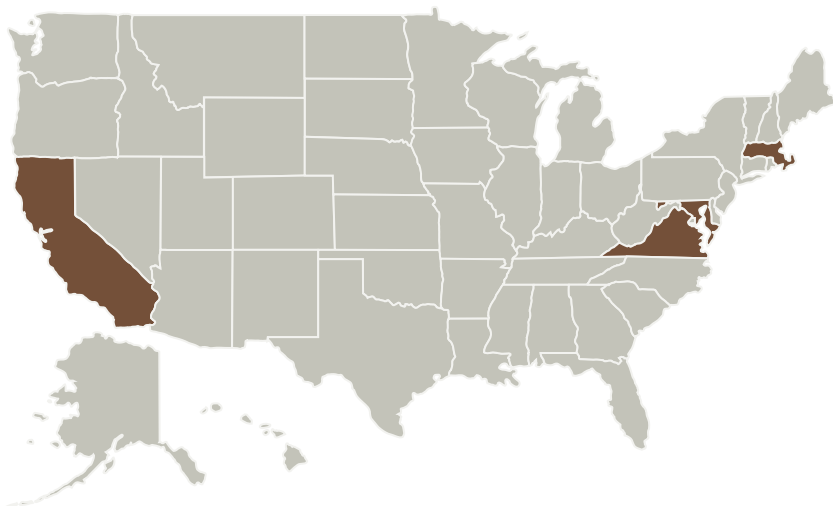
Completed Technology Project (2015 - 2019)



## Project Introduction

We propose a research program involving two conventional balloon flights from Ft. Sumner, NM to study debris disks of five stars. These experiments incrementally build on previous flight-proven subsystems with a goal of conducting fundamental science while maturing key exoplanet technologies. Flight one will use an 0.6 m off-axis telescope system in conjunction with a visible nulling coronagraph to directly image Alpha Lyr, Delta Dra and Epsilon Eri. The flight-proven WASP gondola along with a fine pointing system flight-proven aboard our sounding rocket program will complete the experiment complement. In Flight two, a field-proven Vector Vortex Coronagraph will replace the nulling coronagraph and a field-proven integral field detector, the MKID, will replace the science camera of the first flight. The planned targets for the second flight are Alpha Aql, Tau Cet and Epsilon Eri. With conservative performance estimates, we expect to obtain an image of Epsilon Eri in the second flight as well as some spectral characteristics. Several other targets are available and will be selected if/as time permits. Our simulations indicate the tantalizing possibility of obtaining a direct image of the suggested Epsilon Eri b. If successful, it will produce one or more images of Jupiter-like planets around Sun-like stars. With a deliberate approach of stepwise maturing key enabling technologies while demonstrating important science results, Planetary Imaging Concept Testbed Using a Recoverable Experiment - Coronagraph (PICTURE C), will firmly put us on the path towards realizing the goal of characterizing planets in the habitable zone. In the short-term it will flight demonstrate high priority technologies endorsed by the AFTA and STDT studies.

## Primary U.S. Work Locations and Key Partners



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## Organizational Responsibility

### Responsible Mission Directorate:

Science Mission Directorate (SMD)

### Responsible Program:

Astrophysics Research and Analysis

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Organizations Performing Work	Role	Type	Location
University of Massachusetts-Lowell	Supporting Organization	Academia Asian American Native American Pacific Islander (AANAPISI)	Lowell, Massachusetts

Primary U.S. Work Locations	
California	Maryland
Massachusetts	Virginia

## Project Management

**Program Director:**

Michael A Garcia

**Program Manager:**

Dominic J Benford

**Principal Investigator:**

Supriya Chakrabarti

**Co-Investigators:**

Susanna C Finn  
Gene Serabyn  
Timothy A Cook  
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Dimitri Mawet  
Nikole K Lewis  
Christopher B Mendillo  
Marc J Kuchner  
Mark R Swain  
Benjamin Mazin  
David W Stuchlik

## Technology Areas

**Primary:**

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes

## Target Destination

Outside the Solar System